

**IN THE CLAIMS:**

This listing of claims will replace all prior versions and listings of the claims in the application:

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1. (Original) An ultra wideband receiver that suppresses self-noise, comprising:

a first mixer having a first input, a second input and an output;

a second mixer having a first input coupled to the output of the first mixer, a second input and an output;

AA a codeword generator configured to generate an n-bit non-return-to-zero codeword having a same predetermined sequence of bits as an encoding codeword used to encode a transmitted data stream and invert a predetermined number of bits of the n-bit non-return-to-zero codeword; and

a wavelet generator having an output coupled to the second input of the second mixer and configured to output a sequence of ultra wideband wavelets having a predetermined shape, wherein

ultra wideband wavelets received via an antenna coupled to the first input of the first mixer, the wavelets having encoded therein the transmitted data stream encoded with the n-bit non-return-to-zero codeword,

the n-bit non-return-to-zero codeword is input to the second input of the first mixer, and

the output of the second mixer is a detection waveform having decoded therein the transmitted data stream.

2. (Original) The receiver of Claim 1, further comprising:

an integrator having an input and an output, wherein

the output of the second mixer is coupled to the input of the integrator, and  
a signal output by the integrator is used to decode the transmitted data stream from the  
detection waveform.

3. (Original) The receiver of Claim 1, further comprising:

a network coupled between the output of the first mixer and the first input of the second  
mixer configured to block a DC component of a signal output by the first mixer.

4-6. (Cancelled)

7. (Original) A method for suppressing self-noise in an ultra wideband receiver,  
comprising the steps of:

receiving a received signal of ultra wideband wavelets having encoded therein a  
transmitted data stream via an antenna;

generating an n-bit non-return-to-zero codeword having a same predetermined sequence  
of bits as an encoding codeword used by a transmitter for encoding the transmitted data stream, a  
predetermined number of bits of the n-bit non-return-to-zero codeword being inverted;

mixing the received signal with the n-bit non-return-to-zero codeword to produce an  
intermediate signal;

generating an ultra wideband wavelet signal having a sequence of ultra wideband  
wavelets having a same shape as ultra wideband wavelets used by the transmitter of the received  
signal; and

mixing the intermediate signal with the ultra wideband wavelet signal to produce a detection waveform.

8. (Original) The method of Claim 7, further comprising:

integrating the detection waveform to decode the transmitted data stream.

9. (Original) The method of Claim 7, further comprising:

blocking a DC component of the intermediate signal.

10. (Original) A computer program product, comprising:

a computer storage medium; and

a computer program code mechanism embedded in the computer storage medium for performing an ultra wideband receiver self-noise suppressing method, the computer program code mechanism having

a first computer code device configured to generate an n-bit non-return-to-zero codeword having a same predetermined sequence of bits as an encoding codeword used by a transmitter for encoding a transmitted data stream, a predetermined number of bits of the n-bit non-return-to-zero codeword being inverted for mixing with a received signal to produce an intermediate signal;

a second computer code device configured to generate an ultra wideband wavelet signal having a sequence of ultra wideband wavelets having a same shape as ultra wideband wavelets used by the transmitter of the received signal for mixing with the intermediate signal to produce a detection waveform.

11. (Original) An ultra wideband receiver that suppresses self-noise, comprising:

a de-jam code generator having a first input, a first output, and a second output, the first input being configured to receive a transmit code used by an ultra wideband transmitter, the first output and the second output being configured such that mixing the first output with the second output produces a waveform that correlates to a transmitted waveform being received;

a first mixer having a first input, a second input, and an output, the first input being configured to receive a waveform from an antenna, the second input being configured to receive the first output from the de-jam code generator;

a wavelet generator having an input and an output, the input being configured to receive the second output from the de-jam code generator, and the output being configured to generate a sequence of ultra wideband wavelets having a predetermined shape corresponding to an encoding scheme used by the ultra wideband transmitter; and

a second mixer having a first input, a second input and an output, the first input being configured to receive the output of the first mixer, the second input being configured to receive the output of the wavelet generator, wherein

the output of the second mixer is a sequence of shaped wavelets having decoded therein non-return-to-zero data transmitted by the ultra wideband transmitter


12. (New) A two-stage ultra wideband receiving circuit, comprising:

a first stage configured to mix a received signal with a noise suppression code and generate an intermediate signal; and

a second stage configured to mix the intermediate signal with a wavelet to generate an output signal,

wherein the noise suppression code is the same length as a transmit code used to encode the received signal, and

wherein the noise suppressing code differs in value from the transmit code.



13. (New) The two-stage ultra wideband receiving circuit of Claim 12, further comprising an integrator configured to receive and decode the output signal to provide a decoded signal.

14. (New) The two-stage ultra wideband receiving circuit of Claim 13, wherein the integrator integrates the output signal separately over two or more portions of the output signal to provide the decoded signal.


15. (New) The two-stage ultra wideband receiving circuit of Claim 14, further comprising

a multiplier configured to combine the decoded signal with an adjusting code to provide an adjusted signal,

wherein the product of the noise suppression code and the adjusting code is equivalent to the transmit code.

16. (New) The two-stage ultra wideband receiving circuit of Claim 12, further comprising a DC bias blocking circuit formed between the first stage and the second stage and configured to block a DC bias component of the intermediate signal.

17. (New) The two-stage ultra wideband receiving circuit of Claim 12, wherein the noise suppression code is a non-return-to-zero code.



18. (New) The two-stage ultra wideband receiving circuit of Claim 12, wherein the noise suppression code comprises a first noise suppression portion and a second noise suppression portion,

wherein the first noise suppression portion has equivalent signal values with respect to a corresponding first transmit portion in the transmit code, and

wherein the second noise suppression portion has inverse signal values with respect to a corresponding second transmit portion in the transmit code.

19. (New) The two-stage ultra wideband receiving circuit of Claim 18, wherein the second noise suppression portion is a contiguous portion of the noise suppression code.

20. (New) The method of Claim 7, further comprising:  
multiplying the integrated detection waveform with an adjusting codeword,  
wherein a product of the n-bit non-return-to-zero codeword and the adjusting codeword is equivalent to a transmit codeword used to encode the received signal.

21. (New) The method of Claim 7,

wherein the n-bit non-return-to-zero codeword comprises a first non-return-to-zero portion and a second non-return-to-zero portion,

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wherein the first non-return-to-zero portion has equivalent signal values with respect to a corresponding first transmit portion in a transmit codeword used to encode the received signal, and

wherein the second non-return-to-zero portion has inverse signal values with respect to a corresponding second transmit portion in the transmit codeword.

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21. (New) The method of Claim 8, wherein the integrating of the detection waveform is performed separately over two or more portions of the detection waveform, a combined length of the two or more portions being n-bits.

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